

CLAIMS

1. A method (200) for encoding video signal data for an image block, the method comprising:

- 5 receiving (212) a substantially uncompressed image block;
block matching (214) the image block in correspondence with at least one particular reference picture while excluding non-optimal search points in accordance with a comparison of a normalization of the image block pixels against a normalization of the reference picture pixels;
10 computing (216) motion vectors corresponding to a difference between the image block and the at least one particular reference picture; and
motion compensating (218) the at least one particular reference picture in correspondence with the motion vectors.

15 2. A method (200) as defined in Claim 1 wherein computing motion vectors comprises:

- testing within a search region for displacements within a pre-determined range of offsets relative to the image block while excluding non-optimal search points in accordance with a comparison of a normalization of the image block pixels against a
20 normalization of the reference picture pixels;
calculating at least one of a sum of the absolute difference, a sum of the square difference, and a mean squared error of each pixel in the image block with a motion compensated reference picture; and
selecting the offset with the lowest calculated sum of the absolute difference,
25 sum of the square difference, or mean squared error as the motion vector.

3. A method (200) as defined in Claim 1 wherein block matching comprises:

- storing a normalization of the current picture; and
30 reusing the stored normalization when the current picture is used as a reference picture for coding another picture.

4. A method (200) as defined in Claim 1 wherein block matching comprises:

storing a normalization of the smallest block size; and
reusing the stored normalization for larger block sizes.

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5. A method for processing video signal data for an image block, the method comprising encoding (200) as defined in Claim 1 and decoding (300), the decoding comprising:

receiving (312, 314) at least one reference picture index with the data for the
10 image block, each corresponding to a particular reference picture;

retrieving (318) a reference picture corresponding to each of the received at
least one reference picture index; and

motion compensating (320) the retrieved reference picture to form a motion
compensated reference picture.

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6. A method (200, 300) as defined in Claim 5, further comprising adding
the motion compensated reference picture to the data for the image block to predict
the image block.

20 7. A method (200, 300) as defined in Claim 6, further comprising storing
the predicted image block as a reference picture for future retrieval.

8. A method (200, 300) as defined in Claim 5 wherein the video signal
data is streaming video signal data comprising block transform coefficients.

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9. A video CODEC comprising a video encoder (100) as defined in Claim
1 and a video decoder (400) for decoding video signal data for an image block and at
least one particular reference picture index to predict the image block, the decoder
comprising a motion compensator (460) having an output for determining a block
30 corresponding to the particular reference picture index.

10. A video CODEC (100, 400) as defined in Claim 9, further comprising a variable length decoder (410) in signal communication with the motion compensator (460) for providing the particular reference picture index to the motion compensator.

5 11. A video CODEC (100, 400) as defined in Claim 9 wherein the motion compensator (460) is for providing motion compensated reference pictures responsive to the fast search block motion estimator (180).

10 12. A video CODEC (100, 400) as defined in Claim 9 wherein the video signal data is streaming video signal data comprising block transform coefficients.

13. A video encoder (100) for encoding video signal data for an image block relative to at least one particular reference picture, the encoder comprising a fast search block motion estimator (180) for providing motion vectors corresponding to the
15 at least one particular reference picture, the motion estimator comprising a fast search block matching portion for performing fast search block matching while excluding non-optimal search points in accordance with a comparison of a normalization of the image block pixels against a normalization of the reference picture pixels, the fast search block matching portion having an output responsive to
20 the at least one particular reference picture.

14. A video encoder (100) as defined in Claim 13 wherein the fast search block matching portion comprises at least one of a data reuse portion and a successive elimination portion.

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15. A video encoder (100) as defined in Claim 13 wherein the fast search block matching portion comprises a data reuse portion adapted to store the normalization of the current picture and reuse the stored normalization when the current picture is used as a reference picture for coding another picture.

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16. A video encoder (100) as defined in Claim 13 wherein the fast search block matching portion comprises a data reuse portion adapted to store the normalization of the smallest block size and reuse the stored normalization for larger
5 block sizes.

17. A video encoder (100) as defined in Claim 13 wherein the fast search block matching portion comprises at least one of a sum of the absolute difference calculator, a sum of the square difference calculator, and a mean squared error
10 calculator for performing normalization.

18. A video encoder (100) as defined in Claim 13, further comprising a reference picture store (170) in signal communication with the fast search block motion estimator (180) for providing the at least one particular reference picture and a
15 corresponding particular reference picture index.

19. A video encoder (100) as defined in Claim 18, further comprising a variable length coder (140) in signal communication with the reference picture store (170) for encoding the particular reference picture index corresponding to the at least
20 one particular reference picture.

20. A video encoder (100) as defined in Claim 13, further comprising a motion compensator (190) in signal communication with the fast search block motion estimator (180) for providing motion compensated reference pictures responsive to
25 the fast search block motion estimator.